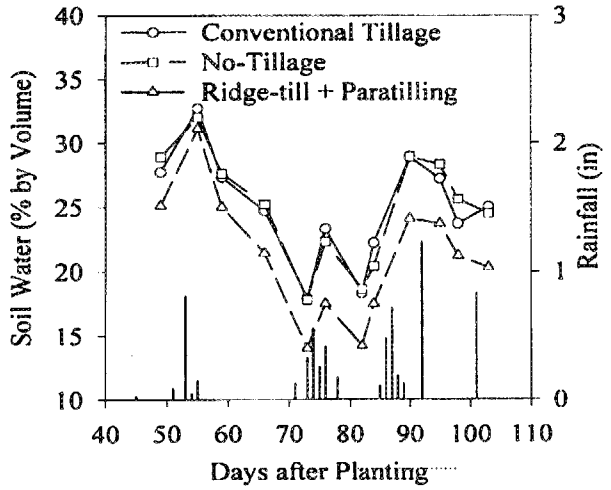

Fig. 2. Volumetric soil water content maintained under-the-row of cotton plants as affected by tillage treatments on a Decatur silt loam in the Tennessee Valley of Alabama.

EFFECT OF TILLAGE PRACTICES ON COTTON IN ALABAMA'S COASTAL PLAIN

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Abstract

Cotton acreage has experienced a resurgence in Alabama in recent years, due to favorable prices and value as a rotation crop. Acreage has increased to nearly 500,000 acres in 1995, or an increase of 30% from 1994.

Most of this increase has come in Southeast Alabama, on sandy, easily compacted soils subject to drought and erosion. Typical production practices include conventional and in-row tillage ("row-till"), usually in combination with in-row subsoiling to shatter a hardpan, and often using a winter cover crop. Cool, wet soils in the spring often limit producers' ability to perform all needed tillage operations in a timely manner, so a study was conducted from 1993 to 1995 to determine the feasibility of performing some of these operations in the fall (stale seedbeds).

Treatments included combinations of spring or fall bedding and subsoiling (rip/hip), with or without a cover crop, rip/hip annually or once every 3 years, row-tilling, and conventional tillage. Plant mapping, yield and quality data were taken.

There were no treatment effects on boll retention, reproductive nodes, or yield in any year. In 1993, lint length was longer with rip/hip in the fall without a cover crop compared to rip/hip with a cover or conventional tillage. However, length was greater in conventional tillage with a cover than without. In 1994, there was no effect of tillage on micronaire, length or strength.

Lint strength was also greater with rip/hip in the fall compared to spring treatments in 1993. Micronaire was decreased by rip/hip, both spring and fall, compared to row-till or conventional tillage. Spring and fall rip/hip increased cotton height in 1993, but only spring and not fall rip/hip increased cotton height in 1994. Residual tillage effects from previous years were not noted.

Weather played a critical factor in the expression of effects from tillage. The 1993 growing season was dry, but a limited amount of irrigation was supplied, and some probable effects of water conservation/availability were noted. 1994 was a relatively wet year, so that plants were rarely water-stressed and there were few effects of deep tillage. In 1995, irrigation was again applied, however, very heavy resistant worm pressure was a confounding factor. In summary, performing needed tillage operations in the fall did not affect yields in any year, but beneficial effects of tillage on lint quality were sometimes lost by performing them in the fall.

MANAGING COTTON FOR REDUCED WIND DAMAGE WITH RIDGE TILL SYSTEMS

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Abstract

A four year study was conducted to compare ridge-till and conventional till cotton cropping systems at Portageville, Missouri. Ridge-till systems provided protection for cotton seedlings from wind and blowing sand. Cotton planted ridge-till into killed wheat was usually taller early in the season than conventional till cotton with greater light interception by leaves. Lint yields from cotton planted with ridge-till into killed wheat were either equal or greater than yields with conventional till cotton. Wheat cover crop in continuous ridge-till systems became less important after two growing seasons as native winter weeds became established.

Introduction

Exposure of cotton to excessive wind is a problem in the Delta region and the Southern High Plains where the topography is level and trees are sparse. In recent years, many trees in the northern Mississippi Delta have been removed around field borders to allow for larger field equipment and center pivot irrigation systems. The incorporation of small fields into larger fields has helped increase labor and equipment efficiency. However, the trees around the fields provided protection for cotton seedlings from early spring wind and blowing sand. In 1995, approximately 25% of the cotton fields in Southeast Missouri had cotton stand losses from wind damage.

Conservation tillage has been hypothesized as a means of protecting cotton seedlings from wind and sand damage (Nabors and Jones, 1991). In the Texas Southern High Plains, Keeling et al. (1995) found that irrigated cotton planted into terminated wheat produced greater yields and net returns than conventional or minimum till without cover crops. They indicated that after five years of continuous cotton planted minimum till without cover crops, yields were lowest relative to other systems and that deep breaking was needed to turn under sand. Barker et al. (1989) reported that cotton exposed to wind produced a smaller plant with less leaf area. Sheltered cotton consistently produced more lint than unsheltered cotton at all planting dates and irrigation levels.

Most of the conventional till cotton in the North Delta region is planted on beds to minimize seedling diseases and promote warmer soil temperatures in the seed furrow (Riley et al. 1964). Valco and McClelland (1995)